

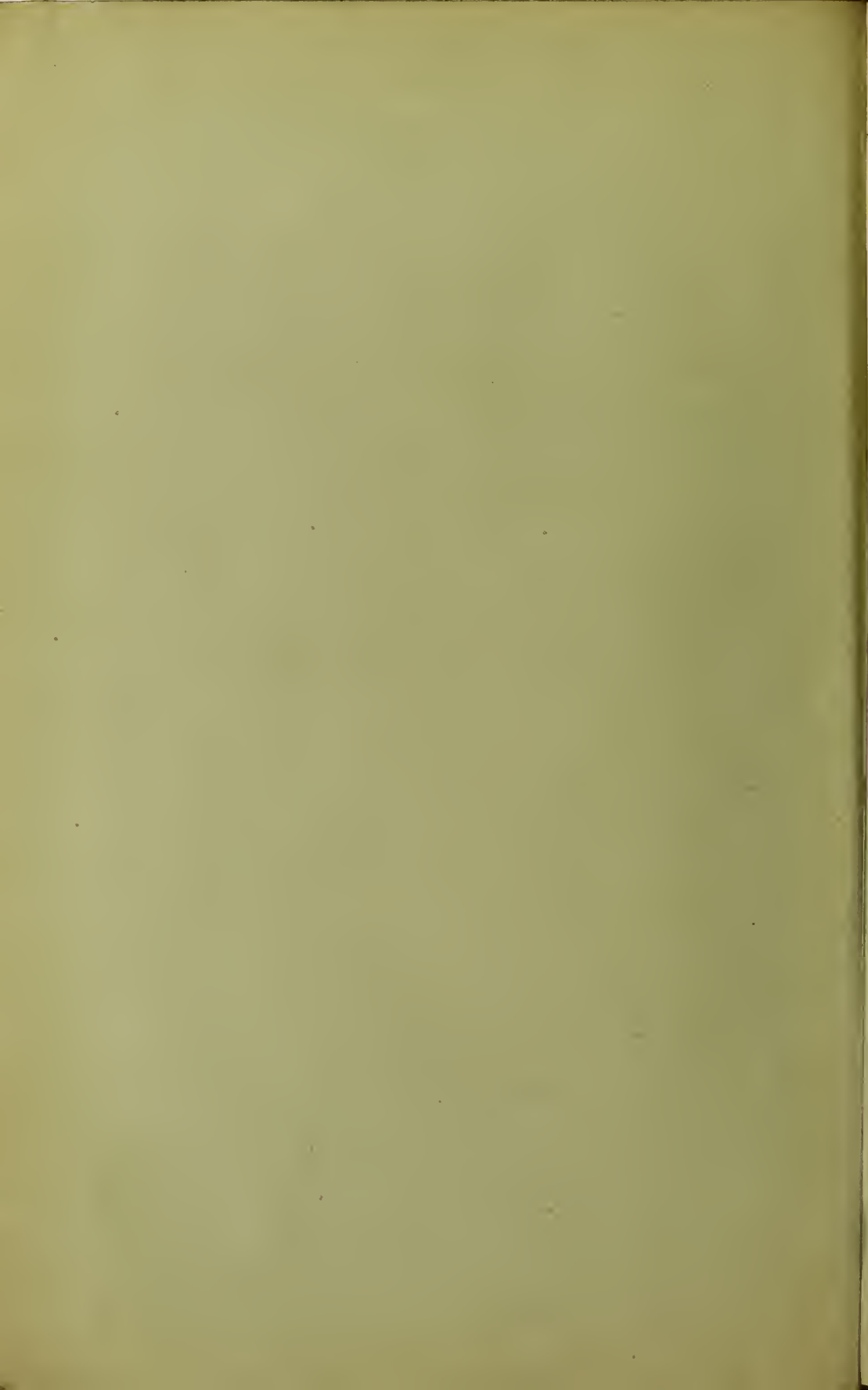
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CATALOGUE
OF THE
PHALÆNIDÆ OF CALIFORNIA.

No. II.

By A. S. PACKARD, JR., M.D.

BOSTON :
PUBLISHED JANUARY, 1874.



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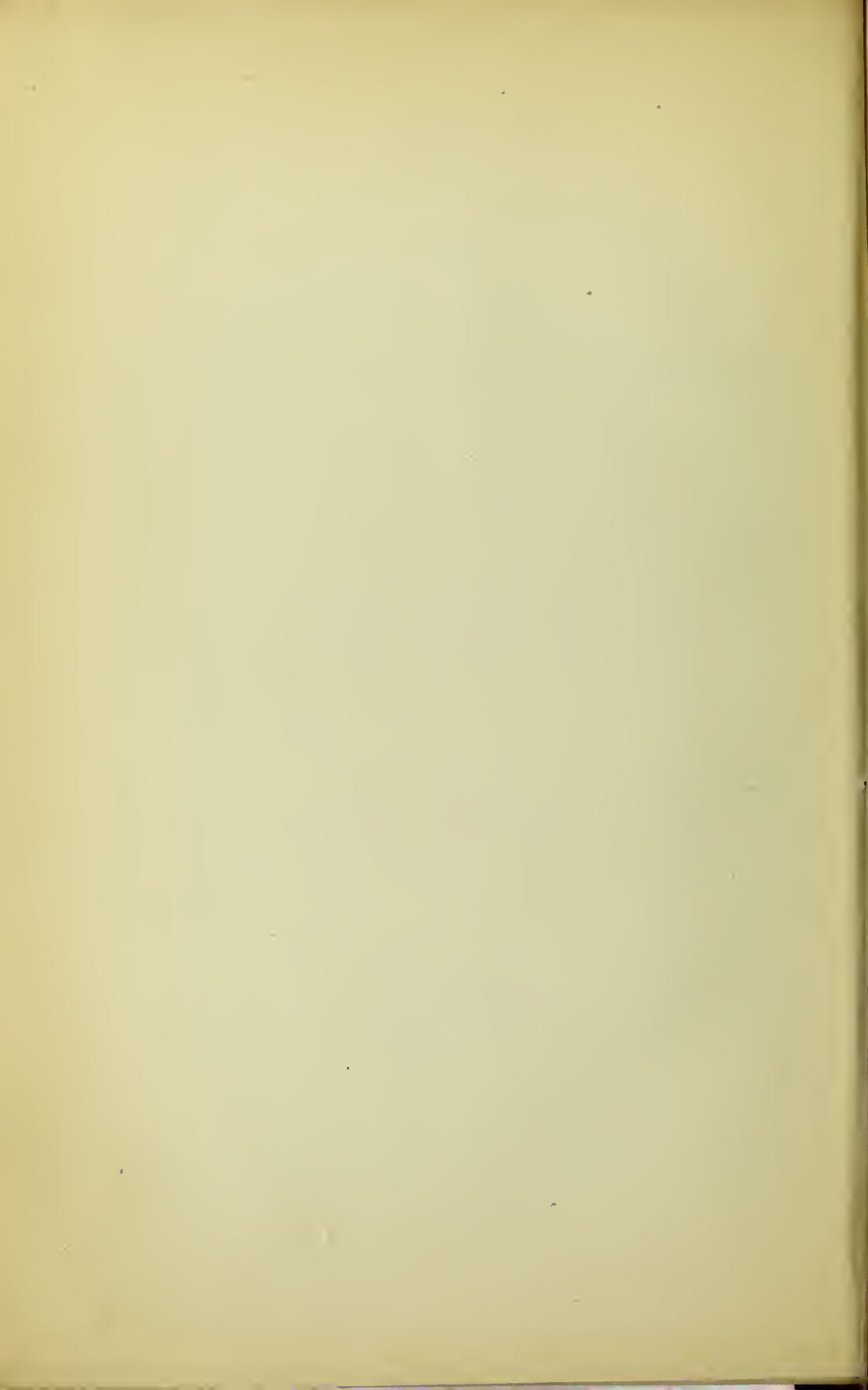
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PHALÆNIDÆ OF CALIFORNIA.

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The receipt of a valuable collection from Mr. Henry Edwards of San Francisco leads me to publish a number of new species contained in the collection, in addition to those described in these Proceedings, Vol. XIII, p. 381. A large proportion of the species received from Mr. Edwards are unique specimens from his collection, and I am much indebted to the liberal spirit he has shown in entrusting them to me for study.

Thanks to his exertions, and the labors of Mr. J. Behrens of the same city, and Mr. Junius Holleman of Goose Lake, Siskiyou Co., Cal., and a collection made by Mr. A. Agassiz for the Museum of Comparative Zoology, as well as the account of Californian species given by M. Guenée, in his work on the "Phalénites," we are able to enumerate about 90 species from California, Nevada and Oregon. Though this is probably less than one-third of the number that will be found to inhabit California and the States adjacent, yet I think we have sufficient data to enable us to make a preliminary comparison, our conclusions being strengthened by what we know of other

Lepidopterous families inhabiting the Pacific States (Oregon, Nevada and California, in distinction from the Atlantic States lying eastward of, and including, the Mississippi basin). I shall reserve for a final monograph of the family, now well advanced, a more complete discussion of the geographical distribution of our Lepidoptera, and it is hoped that much new material may be accumulated, either to disprove or confirm the suggestions here thrown out, and which I wish to be simply regarded as provisional and tentative. I am also hampered in treating of the Californian Phalænid fauna by our scanty knowledge of the species of the Atlantic States, as the number of species which I have been able to accumulate is very small compared with those known to inhabit Europe.

The Phalænidæ (Geometrids) of California (including Oregon and Nevada) seem to be composed of four elements :

1. Of species of genera exclusively American (North and South). Such are *Cherodes*, *Sicya*, *Hesperumia*, *Tetracis*, *Azelina*, *Gorytodes* and *Metanema*. Certain species of these, with several of *Tephrosia* (a genus largely found in the New World) are the most characteristic of the Pacific slope of the United States.

2. The species next most characteristic belong to the following genera : — *Halia*, *Tephрина*, *Selidosema* and *Heterolocha*. Species of these groups occur in Europe, but especially (all except *Halia* which has a species, *H. wavaria*, living in northern Europe) in southern Europe, around the Mediterranean Sea, Western Asia, and Asia Minor; while species of *Heterolocha* occur in Abyssinia and South America (Quito).

3. The next group comprises a few arctic or circumpolar species of *Coremia*, *Cidaria* and *Larentia*, or of cosmopolite genera, such as *Hyppispetes*, *Cidaria*, *Coremia*, *Eupithecia*, *Scotosia*, *Acidalia* and *Boarmia*.

4. There are four species common to both the Pacific and Atlantic States, viz., *Larentia cumatilis*, *Campogramma gemmata*, *Tephrosia Canadaria* and *Azelina Hübneraria*.

In the brief introductory remarks to the first part of this Catalogue (these Proceedings, Vol. XIII, 381) we briefly alluded to the fact that some Californian Lepidoptera repeat certain features peculiar to the fauna of Europe. I find that there are but two forms strikingly European among the Phalænidæ, viz., *Numeria Californiaria* Pack. (wrongly described by me as *Ellopiæ Californiaria*, XIII, p. 384), which is very near the European *Numeria pulveraria*, and quite dif-

ferent from the Atlantic States *N. obfirmaria*, and the genus *Chesias*, which does not, so far as yet known, occur in the Atlantic region.¹

But if we find a very few species which recall the European fauna, there are, on the other hand, many peculiar European genera which do not occur in the Pacific region. In other groups of Lepidoptera there are some species that recall European types; such, especially, are *Papilio Zolicaon* Boisd., representing the European *P. Machaon*, and the genus *Parnassius*, which does not occur in the Atlantic region.

Going out of the Phalænidæ, we find a few European types of Bombycidæ which occur in California, and are not found in the Atlantic States, such as the genera *Epicallia* and *Callarctia*.

On the other hand, we find in California no such development of the genus *Lithosia* as in Europe, no species of *Zygæna*, no *Psychidæ* (except *Phryganidia*, an aberrant form); no such development of *Hepialus*, while *Xyleutes robinæ*, as in the Atlantic States, represents the European *Cossus ligniperda*; moreover the various forms of *Lasiocampa*, and other allied genera, are far less numerous, if not quite wanting in the Pacific region.²

We miss again in the Pacific States any species of *Telea* or *Tropæa*, forms linking the Atlantic or northeastern American entomological fauna with that of northeastern Asia (*Telea* being represented by the closely allied *Anthærea*, and *Tropæa Luna* being represented by *T. Selene* Leach). California has evidently not borrowed her insect fauna from northern China or Japan.³

In the Neuroptera we have strong European features, the genus *Rhaphidia*⁴ occurring in the Pacific States, and not in the Atlantic,

¹ I also referred to a supposed species of *Rumia*. On further examination I find that this and the Maine species are types of a genus different from, though allied to, *Rumia*, and accordingly in the present paper call it *Hesperumia*.

² *L. carpinifolia* Boisd. is, according to Grote, a species of *Gastropacha*.

³ Dr. Boisduval, who was the first to publish a lepidopterous fauna of California, enumerates the following species of Lepidoptera as being common to California and Europe: *Vanessa Atalanta*, *V. cardui*, *V. Antiopa*, *Chelonia caja* and *C. Dahurica*, *Arctia* (*Phragmatobia*) *fuliginosa*, *Gonoptera libatrix*, *Phlogophora metriculosa*, *Amphipyra pyramidea*, *Agrotis exclamationis*, *A. annexa*, *A. saucia*, *A. fumosa*, *A. ravidata*, *Cucullia asteris*, *C. lucipara*, *Plastenis subtusa*, *Noctua triangulum*, *N. plecta*, *Hadena pisi*, *H. protea*, *Monogona Hormos*, *Plusia festuæ*, *P. questionis*, *P. ni*.

These are scarcely more distinctive of Europe than of America, some of them being common to the subarctic regions of the two continents, and others may yet prove to be distinct from the European species.

⁴ *Rhaphidia* has as yet only been found in Europe, northern Asia, and western North America (MacLachlan).

while *Boreus Californicus* is more like the European *B. hyemalis* than our two Atlantic species.

The crustacean fauna of northeastern America, with *Limulus* as its most remarkable feature, repeats that of eastern Asia; but on the other hand Dr. Hagen states that the European genus *Astacus* occurs in California, while *Cambarus* is only found east of the Rocky Mountains.

Mr. F. W. Putnam informs me that of one hundred and seventy-three genera of fishes given by Günther as inhabiting the seas about Japan, only about thirty-six are represented on the northwestern coast of America, and of these thirty-six the majority are also found in the Atlantic, while about eighty others of the Japanese genera are also represented on the southeastern coast of North America and in the West Indian seas, of which a number are found on the western coast of Central America as well. He also tells me that the fresh water fishes of northern Asia, when compared with those of other regions, more nearly resemble those of the northeastern parts of North America, though a number of the genera are also common to both North America and Europe. By the same authority I am informed that there is a striking resemblance between the reptiles and batrachians of northeastern Asia and northeastern America.

My attention has been drawn to a consideration of these features in the geographical distribution of animals by a perusal of the able and suggestive essay by Prof. Gray on the distribution of Californian plants, in his address at the Dubuque meeting (Aug., 1872) of the American Association for the Advancement of Science, and of Mr. Lesquereux' able papers in Hayden's Geological Reports on the Territories, 1872. The main features in the geographical distribution of land animals are apparently the same with those of plants. Prof. Gray shows that "almost every characteristic form in the vegetation of the Atlantic States is wanting in California, and the characteristic plants and trees of California are wanting here" (*i.e.*, in the Atlantic States). We may, on the whole, say of the Californian Lepidoptera, at least, as Dr. Gray remarks of the plants, that they are "as different from [those] of the eastern Asiatic region (Japan, China and Manchuria) as they are from those of Atlantic North America. Their near relatives, when they have any in other lands, are mostly southward, on the Mexican plateau. . . . The same may be said of the [insects] of the intervening great plains, except that northward

and in the subsaline [insects¹] there are some close alliances with the [insects] of the steppes of Siberia. And along the crests of high mountain ranges the arctic-alpine [insect-fauna] has sent southward more or less numerous representatives through the whole length of the country" (p. 10). He then refers to the "astonishing similarity" of the flora of the Atlantic United States with that of northeastern Asia. Our actual knowledge of the insect species of northeastern Asia is most vague compared with the exact knowledge of the botanist, and the comparison we have drawn relates only to generic types.

It is evident that the notion of continental bridges in quaternary times, connecting, for example, Asia and California, is quite unnecessary, since there are, so far as is yet known, no forms characteristic of Asia in the Californian fauna, and the grand difficulty is to account for the presence of a certain resemblance to the European fauna in that of California. Here I think Dr. Gray has been the first to indicate a solution of the problem. Our knowledge of American fossil tertiary insects is at present almost *nil*; we must, then, in the absence of any evidence to the contrary, follow the conclusions of Gray with the later confirmation of Lesquereux.

The ancestors of the Californian *Parnassius*, *Rhaphidia*, and other European forms, may have inhabited the Arctic tertiary continent, of which Greenland and Spitzbergen are the remains, and their descendants forced southward have probably lost their foothold in the Atlantic region, and survived in California and Europe, like the Sequoia in California. Something more than similarity of climate is needed to account for the similarity of generic forms; hence community of origin, with high antiquity and a southward migration of

¹ Dr. Leconte has noticed the similarity of our saline-plains beetles, containing so many species of Tenebrionidæ, to the fauna of the deserts and steppes of Asia. (Proc. Amer. Assoc. Adv. Sci., 1851. Albany meeting, 252.) He also states that "the only manner in which the insect fauna of California approaches that of Europe, is in the great abundance of apterous Tenebrionidæ. But in this respect it does not differ from a large part of South America; and by the very form of these Tenebrionidæ, which bear no resemblance at all to those of Europe, the greater relation of the Californian fauna to that of the rest of America, is clearly proved." Mr. Andrew Murray (On the Geographical Relations of the chief Coleopterous Fauna, p. 36, 1871) also refers to this fact; the genus *Elodes* in California replacing the genus *Blaps*. He adds: "other Heteromorous forms, reminding us of Mediterranean and Asiatic species, occur in California, and the whole of the northwest of America has a greater preponderance of the microtypal stirps than perhaps occurs east of the Rocky Mountains." I should add that Mr. Murray, in explaining the term *microtypal*, states that "the fauna and flora of our own land [Great Britain] may be taken as its type and standard."

forms not of tropical origin, are the factors needed to work out the problem. That something of this sort has taken place in marine animals we know to be the fact. Certain forms now supposed to be extinct on the coast of New England and Scandinavia, such as *Yoldia arctica* Gray (*Nucula Portlandica* Hitchcock), are still living in the seas of Greenland and Spitzbergen. The quaternary fauna of Maine indicates a much more purely arctic assemblage than is at present to be found. This is also the case with the Scandinavian quaternary fauna, according to the researches of Prof. M. Sars. As we have before shown, the circumpolar marine fauna runs down along the coast of northeastern America and of Europe, and the forms common to the two shores have not come one from the other. Europe has not perhaps borrowed in quaternary times from America, but both have been peopled from a purely circumpolar fauna. If there has been any borrowing it has been on the part of Europe, since the fossil musk ox of France and Central Europe is said to be identical with the musk ox of Arctic America. So also on the coast of northeastern Asia and Alaska are circumpolar forms, which have evidently followed the flow of the arctic currents down each coast. The forms which are identical or representative on these two coasts are species derived from the circumpolar fauna; so the forms which are so strikingly similar in northern Japan to those on the coast of New England are, if we mistake not, also derived from the northward. I believe it to be a matter of fact that the Atlantic States species of insects which are common to the two countries, are, if not of circumpolar, at least of subarctical or boreal origin. From these facts we are led to accept the conclusions of Gray and Lesquereux, that co-specific or congeneric forms occurring in California and Europe and Asia, are the remnants of a southward migration from polar tertiary lands during tertiary, and even perhaps cretaceous times; and in proportion to the high antiquity of the migrations there have been changes and extinctions causing the present anomalies in the distribution of organized beings which are now so difficult to account for on any other hypothesis.

For this reason it is not improbable that those species of insects which are more or less cosmopolite (and independently so of human agency) are the most ancient, just as some forms taxonomically the most remote are remnants of earlier geological periods. For example, the curious anomalies in the geographical distribution of *Limulus*, the genus only occurring on the eastern coasts of Asia and North America, accord with its isolation from other Crustacea. Geological

extinction has gone hand in hand with geographical isolation. It was a common form in Europe in the jurassic period, and in the next lower (permian) period but one (the triassic intervening), we find other Merostomata and a few Trilobites.

We make these speculations, hoping that much light will be thrown upon the subject by studies on the rich tertiary insect beds of the west, and of the fossil insects in the arctic tertiary and cretaceous formations. Until then we must regard all foundations for these hypotheses as laid by the fossil botanist.

Camptogramma fluviata (Hübner).

Two females, *i. e.*, *C. gemmata* (Hübner), now shown to be the female of *C. fluviata* by a writer in the "Entomologists' Intelligence," 1858, as quoted in Newman's "Illustrated Natural History of British Moths," p. 172.

California (Edwards).

Larentia 12-lineata n. sp. 3 ♂, 5 ♀.

An unusually small species, half the size of *L. dilutata*, and about as large as *L. albulata* of Europe. ♂ Antennæ well ciliated. Head above whitish gray, in front dark brown; palpi brown at tip, paler below. Body and wings white, with a slight grayish tinge on costa of fore wings and on thorax. Wings of the same form as in *C. dilutata*, except that the apex of the fore wings is rather more pointed. Fore wings white, crossed by about twelve black thread-like lines, waved or scalloped, the outer ones mostly represented by venular black dots. The inner lines are usually scalloped. All the lines are more distinct and broader on the costa, and angulated outwards more or less acutely just below the costa. Across the middle of the wings run three parallel lines finer and nearer together than the others. The marginal row of intervenular black spots distinct on both wings. Hind wings white, with four or five dark slightly marked lines, of which the two inner are scalloped, while the three outer are represented by venular dark points.

Beneath a little more dusky than above, with the lines on the inner half of fore wings wanting; a median double dusky line, ending in a dark clear spot on the costa and inner edge. The lines beyond faint. The marginal black line distinct on both wings. Hind wings marked like fore wings. Discal dots indistinct on both pairs of wings. Abdomen dull whitish unspotted. Fore legs brown, banded with narrow white rings; hind legs whitish.

Length of body ♂, .33, ♀, .30 inch; fore wing ♂, .45, ♀, .40 inch.

This diminutive species seems to occur commonly in California, where it has been collected by Mr. Edwards. It also occurs at San Mateo, Cal., specimens having been collected by Mr. Alex. Agassiz (Mus. Comp. Zoology). It may be recognized by its small size and white, many lineated wings. From Guenée's *L. implicata* it differs in the wings being entirely white and also in the markings as well as the smaller size. We have in the Eastern States a species very near to it, which I describe below as *L. perlineata*,¹ introducing the description here for the sake of comparison.

***Larentia cumatilis* Pack.**

Cidaria cumatilis Grote and Rob. Annals Lyceum Nat. Hist., N. Y., VIII (April, 1867).

Cidaria 4-punctata Pack. Proc. B. S. N. H., XIII, 385 (1871).

I can find no differences between two specimens from the Atlantic States (one G. and R's. type from Buffalo, and one from Maine, collected by myself), and twelve examples from California, collected by Mr. Edwards. It seems to be much more common in California than in the east. It is nearly related to, and congeneric with, *Larentia polata* Boisd. from Labrador and Arctic Europe.

***Cidaria nubilata* Pack.** Proc. B. S. N. H., XIII, 400.

One specimen from Springfield, Oregon, collected by Mr. Junius Holleman.

***Cidaria glaucata* n. sp. 1 ♀.**

Of the size and form of *C. nubilata* Pack., but with the palpi much longer, being of unusual length, the second joint projecting out farther than the head is long, while the third joint is longer and larger than usual. Head whitish on vertex and front; palpi ash brown;

¹ *Larentia perlineata* n. sp. 1 ♂, 1 ♀, closely resembling in size, shape and markings of wings *L. 12-lineata*. The head is whitish gray above, in front dark brown; the palpi brown at tips above. The fore wings are white, crossed by numerous wavy fine lines about twelve in number. It differs chiefly from *L. 12-lineata*, however, in the median line being much broader and more distinct, and with a broad ochreous shade between it and the line beyond. The hind wings are white, with the scalloped lines on the outer half of the wing very distinct, being continuous and a little diffuse. Beneath much as in *L. 12-lineata*, but with four well marked lines in the hind wings, the innermost quite near the base of the wing. Abdomen whitish gray, unspotted. Legs, two anterior pair dusky above, hinder pair white.

Length of body, ♂ .32, ♀ .30; fore wing, ♂ .45, ♀ .42 inch. Albany, N. Y., May 4th. (Lintner.)

This small species is half the size of *L. dilutata*, and differs in having about twelve fine lines on the fore wings, and four or five unbroken lines on the hind wings. The median line on the fore wings being very distinct and with a brownish and ochreous shade beyond.

antennæ minutely ringed with white and brown. Thorax and fore wings pale glaucous green. Fore wings with a brown squarish spot at base of submedian space; wing clear green beyond, just within the middle crossed by a broad compound band directed obliquely outwards towards the middle of the inner edge; the band is made up of two filiform slightly sinuated blackish and red lines, enclosing on each side of the median wavy smoky gray band a broad green band. Beyond is a broad clear space. A much sinuate submarginal smoky band starts from the inner angle, and after a long outward curve ends on the costa (just below which it is dislocated), at a distance from the apex equal to the thickness of the thorax; some black and reddish scales are strewn along the edge of the band. From a squarish thickened portion, as if broken off from the band, reaches out towards the apical black streak, a similar short black stripe; a marginal narrow thread-like black line. Fringe whitish, dark at the ends of bands. Hind wings whitish, with two parallel curved, slightly scalloped dusky lines, situated nearer the outer edge than usual. Both wings beneath pale whitish, concolorous with the upper side of the hind wings, with very faint indications of two outer parallel dusky lines common to both wings. Legs brown, ringed with white.

Length of body .60, fore wing .70 inch. California (Edwards).

This fine species may at once be known by the pale sea green thorax and fore wings, the latter with the obliquely broad band directed outwards, and by the unusually pale hind wings and under surface of both wings, as well as by the very long palpi.

***Hypsipetes viridata* n. sp. 1 ♀.**

In a perfect state of preservation. Closely allied structurally and as regards size to *H. 5-fasciata*, the palpi being long, and extended as far in front of the head as the latter is long; the outer edge, much as in *H. 5-fasciata*, being less oblique than in some other species; the third subcostal interspace is narrower than in *H. 5-fasciata*. Head, thorax and fore wings deep sea green, mixed with dull clear dark smoky ash, and some yellowish green and a few black scales. Palpi with no green scales, but black and pale ash, being darker below than above. Antennæ finely ringed with white and blackish. Fore wings of a sea green ground color, with numerous fine transverse strigæ, crossed by five clear smoky ashen sinuous bands finely edged with black; the basal very short and narrow close to the base of the wing; the second line is narrow, ends farther from the base of the wing on inner than on costal edge, and is angulated outward conspicuously on

median vein. The third band is close to, and parallel with, the second, and twice as wide; it is bent outwards on the median and submedian vein. A fourth faint narrow band close to third. The fifth, or submarginal line, is twice as broad as third, and very remote from the latter (which is within the middle of the wing); it is nearly straight on the inner edge, though curved outwards just below the costa, while the outer edge is deeply and subacutely scalloped between the venules much as in *H. 5-fasciata*; the band is half as wide on the inner edge as on the costa. Fringe on both wings with a faint median line. Hind wings smoky, with two transverse parallel dusky lines. Beneath much as in *H. 5-fasciata*, being smoky ash, with two dusky bands on both wings beyond the middle, broadest and darkest on costa, less curved and farther apart, and farther from outer edge than in *H. 5-fasciata*. A faint discal dot, better marked on hind wings. Abdomen and legs nearly concolorous with hind wings.

Length of body .52, fore wing .67 inch. California (J. Behrens).

This handsome species may be readily recognized by the sea green color of the fore wings, and by wanting the apical oblique streak.

Hypsipetes speciosata n. sp. 2 ♂.

This is by far the largest and most showy species of this genus yet known to us. Body pale ash, with a luteous tinge; palpi long, brown. Fore wings pale green, arranged in broad bands alternating with equally broad blackish bands, varying as usual in width. The green band in the middle of the wing is partly, or almost wholly white. Six unusually distinct black bands; the insertion of wing black; the first band beyond very narrow, and bent outwards on the median vein; the second very broad and more regular than those beyond, bent outwards at right angles in the discal space; the whitish line is edged on each side by blackish interrupted lines, the spots varying much in size. The submarginal band also dislocated, and very irregular, bordered internally with whitish; this band is merged towards the apex with the marginal band, consisting of a row of triangular spots. Fringe dark brown. Beneath costa paler than rest of wing, with five large square dark brown conspicuous spots. Hind wings smoky gray, beneath with two broad, submarginal dusky bands.

Length of body (not including palpi) ♂ .54 inch; fore wing ♂ .73 inch. Mendocino City (A. Agassiz, Mus. Comp. Zool.).

This showy species may be identified by the black and green bands on the fore wings, the central band more or less whitish, and by the large square costal spots on the under side. In one specimen the

margin of the fore wing is almost wholly black, with a short vein of whitish green spots.

Melanippe Kodiakata n. sp. 1 ♀.

A little smaller than, but closely allied to, *M. concordata* Walk. from New England. Body and wings blackish, body whitish beneath. Fore wings blackish on basal half, with greyish scales, and a zigzag line just before the black discal mark. Just beyond the discal dot a broad whitish band, wider on costal than on inner edge, diffuse externally; on the inside scalloped, and slightly excavated on the median vein, but not so much so as in *M. concordata*. Beyond this band are two obscure pale wavy lines, the outer ending on the costa, close to the apex (these are wanting in *M. concordata*). Edge of wing with a narrower black line; fringe paler than in the other species, checkered with black. Hind wings with a broad white band, obscure on the hind edge, and angulated outwards just below the middle of the wing. Beneath both wings white, with wide black borders, but white at base, with a basal blackish shade; an outer blackish band enclosing the darker large distinct oval discal dot, and below this angulated outwards. Hind wings white, with a broad black border, and a narrow dark line just beyond the distinct black discal dot, which is much smaller than that on primaries. Legs blackish, ringed with white.

Length of body .37, of fore wing .52 inch. Kodiak Is., Alaska (Edwards).

A smaller species than *M. concordata* Walk., from Hudson's Bay and New England; it differs in the white band on the primaries being much straighter on the inner edge, as it is much less excavated, and in having two greyish lines beyond, while the hind wings have a broad white band, where in *M. concordata* they are entirely black.

Cleora umbrosaria n. sp. 1 ♂.

Body and wings ash colored, or pepper and salt; vertex of head pale ash. Fore wings crossed by two scalloped lines, the scallops rounded, not pointed; the basal line straight from the costa to the median vein, thence curved inwards to the inner edge of the wing; outer line begins on the outer quarter of costa, and follows a nearly straight course to outer third of inner edge, there being no great curve above the third median venule, as in *C. pulchraria* Minot and *pellucidaria* Pack., of the Eastern States. Discal dot black. Hind wings in my single specimen without any line; the wing is speckled with dark gray on the outer third. Beneath, the wings are uniform

ash colored, the fore wings scarcely darker than hinder pair. No discal spots, or other markings.

Length of body .55, of fore wing, .75 inch. California (Edwards).

This seems to be a larger species than the two eastern ones, and differs in the outer line being nearly straight in its course, the scallops being well rounded, and in having no line on the hind wings, and no markings apparent on the under side of either pair. The fore wings are much produced at the apex, as in *C. pellucidaria* Pack. The antennæ are broadly pectinated, as usual.

Gorytodes uncanaria Guen. 1 ♂.

Body and antennæ (which are broadly pectinated) pale ash, concolorous with the hind wings. Fore wings ash, speckled with brown, with two dark short longitudinal streaks, one on each side of the base of the median vein. The costal half of the middle area of the wing occupied with a large low irregular triangular dark brown area, edged externally with darker; apex ending in a knob, in one specimen produced angularly outwards, and connected with (sometimes separated from) an irregularly oval patch under the third median venule, and which is traversed by a longitudinal mesial white line. A sinuate white marginal line, beginning just before the apex, and ending on the inner angle, and edged within with dark brown. Fringe pale ash checkered with blackish. A black conspicuous discal dot, in rubbed specimens centered with white. Hind wings pale ash, with a faint discal dot, and a dark narrow marginal line. Beneath more or less marbled with dark speckles. Fore wings with two parallel white lines fading away below the costal region, a slight ochreous tint along the costa; a faint discal dot. Hind wings pepper and salt, with two dark, parallel, broad shades, angulated on the discal interspace; the outer line nearly touching the edge of the wing; discal dot larger and more distinct than on fore wings.

Length of body .60, of fore wing .75 inch. California (Edwards).

A fresh specimen received from Mr. Edwards differs from certain others more rubbed (and which better agree with M. Guenée's description) in having the large oval brown spot below the median vein of fore wings distinctly united with the large costal triangular area, and in the more distinct bands on the under side of the wings.

Gorytodes trilinearia n. sp. 2 ♂.

Whitish ochreous. A larger species than *G. uncanaria*, the antennæ with much shorter pectinations, the palpi as long, but slenderer, the wings of the same form, but with the apex of primaries

more rounded, the wing being a little less falcate. Fore wings white at base, and traversed by three white zigzag lines, the basal one on the inner fourth of wing, with a large angle on the submedian space, the apex of the angle filled in with a few black scales, as also the outer side of the line (widest here) in the discal space; from the submedian angle is thrown out a narrow white line, running through the middle of an oval ochreous patch. A longitudinal white streak in the discal space, and beyond a large lunate transverse white spot, the two forming a very distinct exclamation mark. Beyond two parallel zigzag white lines, the inner scalloped deeply below the first median venule; the outer is curved at the apex, and with a broad angle on the independent vein. Fringe white, checkered with dark brown. Hind wings white, fringe white. Beneath as above, but the hind wings are crossed by two irregular, rather distinct and broad bands of ochreous with black scales, and the base of the wing is faintly peppered with dark and ochreous scales.

Length of body .66, fore wing .82 inch. Nevada (Edwards). Arizona (Dr. Palmer, from the Museum of the Department of Agriculture at Washington).

An exceedingly elegant moth, at once recognizable by the three white lines and the mark of exclamation in the discal space, and the narrowly pectinated antennæ. The specimen from Arizona is in bad condition, but does not seem to differ from the Nevada example.

***Panagra subminiata* n. sp. 1 ♀.**

Differs from any other species known to me, by the vermilion red on the costa and veins, especially beneath, the upper side of body and wings being uniform ash, tinged faintly with vermilion. Front reddish ash, dull red on orbits; the greyish hairs projecting between the palpi well marked. Palpi stout and bushy, concolorous with the orbits, with a dark spot beneath; vertex grey, like the thorax. Antennæ reddish. Fore wings reddish ash, especially on the costa and veins. A linear pale brown interrupted curved line, ending in a wider costal spot. Discal dot distinct, brown. Outer line forming a broad sinuate shade ending just before the costa. Fringe concolorous with the rest of the wing, with a faint pale line just beyond the middle. Hind wings a little paler than fore wings, speckled with brown scales; fringe a little darker, as in fore wings. Beneath, both wings deeply tinged with vermilion, especially costa of fore pair and

entire hind wings, veins vermillion; between them finely marbled with ash and brown scales. Legs tinged with reddish.

Length of body ? (abdomen wanting); of fore wing .63 inch. Goose Lake, Siskiyou Co., Cal. (J. Holleman).

This fine species, communicated by Mr. Holleman, to whom the Museum of the Peabody Academy is indebted for a good many rare specimens from Northern California and Oregon, may at once be known by the reddish ash upper side of the body and the vermillion color of the under side of the wings, by the absence of the usual line on the hind wings, and by the outer line on primaries being diffuse, not sharply defined as usual.

***Halia 4-linearia* n. sp. 2 ♂.**

Closely resembling *H. wavaria*, to which section of the genus it belongs, the wings being less falcate than in the other species, *marcessaria* and *tripunctaria*. The antennæ are more broadly pectinated than in *H. wavaria*, being in this respect intermediate between *H. wavaria* and *tripunctaria*. Pale ash grey. Head, palpi and body being concolorous with the wings. Fore wings marked as in *H. wavaria*, having four distinct costal brown spots, from which as many lines run parallel to each other to the costa; the second one includes the discal dot, but is straighter, not so much angulated as in *H. wavaria*, nor so wide just above the discal dot; the two outer lines become obsolete in the middle of the wing, but are indicated on the hind edge, the third being close to the fourth, while beyond is a small dusky patch. A row of intervenular black marks, fringe concolorous with the rest of the wings. Hind wings with no marking, except the discal dot, which is quite distinct. Beneath pale ash, more uniformly so than in *H. wavaria*, tinged faintly with ochreous, deeper on costa of fore wings. Discal dots present on both wings, and three faint costal patches.

Length of body .48; fore wing .64 inch. Sierra Nevada, Cal. (Edwards).

Closely resembling *H. wavaria*, it differs in the more broadly pectinated antennæ, the less angulated narrower second line on primaries, and the duller ash on under side of wings, which, especially the secondaries, are beautifully marbled in *wavaria*; in these respects it resembles the species of *Macaria*.

***Halia tripunctaria* n. sp. 1 ♂, 1 ♀.**

Antennæ with much longer pectinations than usual, being much longer than in *H. marcessaria*. Palpi as usual. Fore wings with the

apex more produced than in *H. marcessaria*, being acutely falcated. Abdomen without the two rows of black dots present in *marcessaria*. Fore wings uniform fawn color, body and hind wings paler. An inner straight brown line, edged externally with yellowish brown; outer line slightly sinuate. Discal dot large oval lanceolate; two conspicuous dark spots midway between the outer line and the edge of the wing, one being subapical in position. Fringe on both wings a little darker than the wings themselves. No markings on hind wings, no discal dot. Beneath, a decided ochreous tinge, no lines, discal dots distinct on both wings; fringe considerably darker than the rest of the wing. ♀ differs from ♂ in the lines being farther apart.

Length of body ♂ .50, ♀ .50 inch; of fore wing ♂ .60, ♀ .66 inch. California (Edwards and Behrens).

This species differs from *marcessaria* Guen. and *cineraria* Pack., in the much more pectinated antennæ and the absence of lines on the under side of the wings, which beneath are clear ochreous, not speckled with dark scales, while the two spots with the discal spot arranged in a triangle, gives it a characteristic appearance.

Macaria Californiaria Pack. Proc. B. S. N. H., XIII., p. 392.

Two ♀, collected by Mr. J. Holleman, differ from those previously described by me in some important respects; the present description therefore applies better to the more normal form of the species. Pale whitish grey. Orbits and palpi tinged with ochreous. Fore wings with four costal spots, from which more or less obsolete lines run in a faint series of dots across the wing, second spot the broadest, the discal dot forming a part of the line, third spot forming with a part of the line proceeding from it, a large irregular S extending to the middle of the wing, the line continuing beyond in an interrupted series of fine dots, and with a supplementary spot at the end of the S. Halfway between the S and the apex is a fourth small costal dot. Hind wings with an obscure discal spot, and a submarginal transverse shade; the wing is faintly mottled with smoky dots. Beneath both wings with fine transverse subochreous spots, the lines appear beneath of a smoky ochreous, the third line being less sigmoid than above, as it is curved outwards to the angle, and then goes obliquely and in a straight course to outer third of inner side. Discal dots distinct, as above. Hind wings with a distinct outer subochreous broad band near the edge of the wing. A row of dark dots along edge of both wings.

Length of body .32, fore wing .55 inch. Goose Lake, Siskiyou Co., Cal., (J. Holleman).

It may be known by the S-like third costal spot, the more yellowish tint of the under side of the wings, and by the presence of an outer shade on hind wings. The sigmoid spot is much like the bent spot in the middle of the wing in *Halía wavaria*.

***Acidalia subalbaria* n. sp. 1 ♀.**

Allied in general form to *A. 5-linearia*, but with the apex of fore wings much blunter, with the hind wings much shorter, and with the outer edge rounded, instead of angulated. Head and antennæ white, front with a broad black band just below the insertion of antennæ. Cream colored, being whitish with a very faint ochreous tinge, whiter and less speckled, with darker scales than *A. 5-linearia*. Primaries crossed by three light brown lines, the basal slightly curved, farther from the base of the wing than usual. The two outer lines much nearer together than usual, the inner one being narrower and less distinct; both are less oblique than usual, and not waved. Discal dot obsolete. Hind wings with a discal dot, and beyond the two parallel outer lines same as on hind wings. Both wings with a narrow black line at base of the whitish fringe. Beneath cream white, discal dots distinct on both wings, those on primaries largest; beyond them a common diffuse dusky line, straight on fore wings. A fine narrow brown line at base of fringe. Legs white, fore femora and tibiæ blackish in front.

Length of body .30, fore wing .47 inch. California (Edwards).

In this species the wings are clearer whitish than usual, especially on the under side, and the two outer lines are nearer together than usual, while the hind wings are shorter, and with the outer edge less convex than usual in those species in which the hind wings are rounded instead of angulated.

***Acidalia rubrolinearia* n. sp. 1 ♂, 1 ♀.**

Closely allied to *A. Californiaria*. Dull reddish ash; the fore wings with four dull brick red wavy lines (three on hind wings). Body and appendages, including legs, a little darker than wings, especially on the under side of body, where there are black scales mixed with the brown ones. Palpi stout and bushy, with unusually long hairs. Antennæ with long dense ciliæ; beneath black, above pale brown. Wings a little darker at base than externally; fore wings with a basal curved reddish brown line; an indistinct brown discal dot; beyond three parallel dull reddish brown wavy lines, the

inner twice as broad as the outer. An interrupted fine black line at the edge of the fringe on both wings. Hind wings with three lines, the inner straight, the broadest and darkest wavy, within which the wing is dusky. Fringe on both wings reddish snuff brown.

Beneath, the wings are a little clearer than above, with the two middle lines very distinct, reddish brown, the inner less wavy than the outer, the wing within being dusky, edge of wing with the black line and fringe as above. Legs reddish brown, tarsi paler, though with scattered black scales.

Length of body ♂, .35, ♀, .33 inch; fore wing ♂ .43, ♀ .43 inch. California (Edwards).

This species is deeper brick red than usual, and the scales on the palpi are longer and more spreading than usual, with four brick red lines crossing the fore wings; the middle line on hind wings is much more waved than in *A. Californiaria* Pack.

***Hyria occidentaria* n. sp. 1 ♂.**

Fore wings with much the same shape as in *H. auroraria* of Europe, though the apex is slightly more rounded, while the hind wings have the outer edge more rotund. Antennæ finely ciliated. Body and wings very pale fawn brown, tinged very faintly with vinous, vertex of head pale; front and palpi dark brown. Fore wings clear pale fawn, with the middle occupied with a broad dark hour-glass shaped band, wider on the front edge than on the inner; the inner side quite regularly hollowed out, the outer side produced outwards in the middle, with two acute parallel teeth, and a third below situated farther within the wing; below this the band dilates on the inner edge, while on the costal side it goes nearly straight to the costa; a diffuse faint submarginal shade. On both wings a row of venular marginal black dots. Fringe long, silky, concolorous with the wing. Hind wings with same markings as on fore wings, but with the submarginal shade rather more distinct; the broad band has two larger teeth on the outer edge, and the shade beyond has two zigzag angles parallel with it. Obscure yellowish discal dots on both wings (distinct under a lens). Legs pale, fore femora and tibiae dark, Beneath smoky, the bands being replaced by diffuse smoky lines.

Length of body .24, fore wing .33 inch. California (Edwards).

This fine species differs from an undescribed Texan species to which it is structurally closely allied, in having rather darker wings, with the submarginal band much darker, and the form of the middle band quite different.

Eunemoria n. gen. ♂.

Allied to *Nemoria*, but the head is much narrower in front, and not so broad on the vertex; in front the sides are nearly parallel. Palpi about as long as in *Nemoria*, but much stouter, slightly ascending, third joint distinct, thick, rounded. Antennæ pectinated nearly to the ends, the branches short, those in the middle of antennæ about twice as long as the joints. Fore wings shaped much as in *Nemoria*, but rather more pointed at the apex; outer edge straighter, hind wings long, much more rounded, and not angulated, as in *Nemoria*.

The costal space of fore wings is very much narrower than in *Nemoria*. Abdomen shaped much as in *Nemoria*, being acutely pointed at the tip, which just reaches the anal angle of the hind wings. Hind tibiae swollen, with four stout acute spurs, while there are but two (terminal) in *Nemoria* (male); a long large accessory tuft, as in *Nemoria*. Hind tarsi slender, nearly two-thirds as long as tibiae, while in *Nemoria* they are half as long as tibiae and stouter. The single species known is light green, with a single rather broad common line, not wavy and straight on the fore wings, curved on the hind wings.

Eunemoria unitaria Pack. 1 ♂.

Palpi pink; front red; vertex white and antennæ white above; abdomen white; thorax and wings deep pea green, deeper than in most species of *Nemoria*. Extreme costal edge white. A single common white line crosses both wings; on the primaries it is straight and situated just beyond middle of wing; on hind wings it is well curved, and situated just beyond the middle of the wing. Fringe white, on the outer edge pinkish. Two anterior pair of legs reddish.

Length of body .45, fore wing .53 inch. Nevada (Edwards).

The narrow red front, and structure of hind legs, the pinkish edge to fringe, and rather large size, are the distinguishing marks of this species.

Eunemoria tricoloraria Pack. 1 ♂.

Antennæ well pectinated, white above; palpi stout, red, white along the lower edge, wing much as in the eastern species, *E. rubivora* (Riley sp.) Pack. Front duller red than palpi, vertex white, with a few reddish scales at base. Body and wings pea green. Fore wings green, costa white, tinged with red at the base. Two curved, much wrinkled white lines cross each wing, nearer together and more waved than usual. Fringe green. Whitish at insertion, and at the

outer edge. Fore and middle tibiæ and tarsi reddish. Beneath fore wings pale, deeper green on the costal half; basal two-thirds of costa deep red. Hind wings whitish green. The outer line on fore wings faintly reappears. Abdomen wanting.

Length of fore wing .40 inch. California (Edwards).

Chlorosea¹ n. gen.

Belonging apparently to the same group as *Nemoria* and *Eunemoria*, and less closely to *Phorodesma*. Head with the vertex not so broad in proportion as in *Nemoria* or *Pseudoterpna*; front moderately broad, less so, however, than in *Nemoria*. Palpi rather long and slender, projecting farther than usual beyond the front (though not nearly so much so as in *Synchlora*), slightly ascending; third joint small, but distinct. Antennæ pectinated almost to the tip; branches about half as long in proportion as in *Nemoria*; in ♀ slender and filiform. Fore wings shaped much as in *Nemoria*, costa curved in the same manner, apex subacute, outer edge curved in much the same way. The costal space is slightly narrower in proportion than in *Nemoria*, and the fifth subcostal or subapical space is small, being one-fourth as long as the wing, while in *Nemoria* it is much larger, being one-third as long as the costa of the wing. Hind wings of much the same shape as in *Phorodesma* and *Pseudoterpna*, not being produced and subangulated, as in *Nemoria*, or so long and fully rounded, as in *Eunemoria*; the apical region is full and rounded, while the outer edge is very straight. The abdomen does not reach the anal angle of the hind wings; its shape is much as in *Nemoria*. Hind legs unusually small, tibiæ very slender and short, shorter than the tarsi, and with but a single terminal pair of spurs in both sexes. No essential difference between the sexes.

Coloration much as in *Nemoria*. The known species are of larger size than usual in the allied genera.

Palpi less ascending than in *Nemoria*, antennæ one-half as widely pectinated, but wider than in *Eunemoria*. The hind legs are much as in *Phorodesma*, but there is but one pair of spurs, and the vertex is not so broad as in that genus, while the antennæ are pectinated nearer the tip.

Chlorosea Nevadaria n. sp. 1 ♂, 2 ♀.

Pale pea green. Head whitish at the insertion of the antennæ (which are white above), but greenish on the hinder edge of vertex; front pale greenish, pink on the orbits; palpi whitish; thorax green;

¹ Κλωρός, green; σής, moth.

abdomen white. Both wings pale green; fore wings whitish on extreme edge of costa; an oblique, rather broad band, straight in its course, crosses the wing from just beyond the middle of the inner edge to the outer fifth of the costa; it is situated nearer the outer edge in the ♀. No other markings. Hind wings slightly paler than primaries, with no markings. Beneath uniformly pale green, hind wings a little paler than primaries. Legs whitish, two anterior pairs of tibiae pink.

Length of body ♂, .55, ♀, .45-.50 inch; fore wing ♂, .70, ♀, .60-.68 inch. Nevada (Edwards).

The smaller of the two ♀ has paler hind wings, and an entirely reddish front. The species may be recognized by the large size, the want of any markings on the hind wings, and by the very slender hind legs with the single pair of tibial spurs.

***Tephrosia nigroseriata* n. sp. 2 ♂.**

Differs from any other Californian species by its rust red color, and its two rows of black points. Palpi long and slender; antennae thickened, ciliated. Head and thorax pale rust red, concolorous with primaries. Fore wings not falcate, apex, however, subacutely pointed; outer edge full, convex; hind wings not so sinuate as usual on outer edge. Fore wings uniformly pale rust red, with obscure scattered dark scales, and a slight dark discal point; two series of black points, inner oblique, but not curved, angulated slightly on costa; outer row of submarginal venular black dots, and a corresponding series on hind wings. A row of fine black dots along the base of the fringe. Hind wings with no apparent discal dot, paler than fore wings, with no specks. Fringe concolorous with the rest of the wing. Beneath of the same tint as above, with the row of black submarginal dots common to both wings; no inner line. Hind wings much more speckled with black than above, and with a conspicuous black dot. A dusky shade in the middle of the fore wings. Abdomen long and slender, passing beyond the inner angle of secondaries.

Length of body .55, fore wing .60 inch. California (Edwards).

The pale rust red tint, and two distant rows of black points, will serve to distinguish this species from any described by Guenée.

***Tephrosia falcataria* n. sp. 1 ♂.**

This species has remarkably falcate wings, the tip of the fore wings being acute, the costa being more bent down at the tip, and the outer edge excavated much deeper than usual; the costal area is wider,

hence the four subcostal venules are shorter than usual, but their mode of branching off is the same, being much as in *T. nigroseriata* Pack., to which the species is more closely allied than any other form known to me. Antennæ well pectinated, dark brown, as usual, contrasting with the rest of the body. Head, thorax and fore wings pale reddish fawn color; hind wings and abdomen much paler, much more whitish than in the other species. Fore wings with very uniformly reddish fawn, with no conspicuous bands or rows of spots and remarkably few scattered dark scales, the wings in all the other species known to me being more or less densely dusted. Discal dot small, black; a submarginal row of about six obscure dusky spots, arranged in a straight line parallel to the outer edge. A marginal series of black venular points. Fringe deeper reddish than wing itself. Hind wings almost whitish fawn, unusually clear, with a few faint scattered dark scales; a dark discal dot; fringe reddish, concolorous with that on fore wings; no other markings on the wing. Beneath both wings alike, a little less pale than hind wings behind, but tinged with reddish on the edges, and more specks. Discal dot and marginal row of dots as above. Fringe darker than rest of wings. Hind wings a little more dusted than primaries. Discal dot much larger and more conspicuous than above. Abdomen not spotted.

Length of body .50, fore wing .64 inch. California (Edwards).

Known by its unusually falcate primaries; its clear wings free from the usual bands and scales, and by its reddish hue.

Tephrosia Canadaria Guen.? ♂. I cannot find any difference between one rubbed ♂ specimen of this species, and individuals from New England, but others are needed for a more thorough comparison.

Hemerophila latifasciaria n. sp. 1 ♂.

Of medium size; antennæ broadly pectinated, hind wings rounded, as usual well dentated. Body and wings pale ash; front with a round dark spot; palpi with the third joint black. Hind edge of prothorax, and hinder edge of the basal segments of the abdomen with a black band. Fore wings pale ash, with a broad curved basal blackish band; outer line slightly oblique; straight on the inner edge, curved inwards in the middle of the wing; thence going straight to the costa; this portion of the line is represented by three or four venular dots, the costal one being the largest, while the posterior two-thirds of the line is bordered externally by two diffuse parallel

broad lines, the whole making a broad band. Costal edge speckled with dark ash. Outer edge scalloped, with a black point between each scallop. Hind wings concolorous with fore wings; two parallel slightly waved lines; beyond the middle of the wing a very distinct, nearly straight blackish line, with a supplementary brown shade beyond. A submarginal broad shade. A black line follows the scallops. Fringe whitish. Beneath uniformly pale, costa with transverse dark strigæ, the outer band forms a smoky shade beneath, and on hind wings a smoky line. Legs ash, two anterior pairs of tibiæ and tarsi broadly banded with blackish.

Length of body .60, fore wing .73 inch. California (Edwards).

Metanema aurantiacaria n. sp. 1 ♀.

Body ochreous, wings orange-ochreous. Palpi slender, passing slightly beyond the front. Fore wings orange-ochreous, no inner line apparent, outer line oblique, but in its course very straight, not bent on the costa; it is brick red in color, shaded inside towards the middle of the wing with deep ferruginous orange. No markings on the edge of the wing. A single line on hind wings, straight, not reaching the costa, and of the same color as that on the front wings. Beneath, the wings are of the same color as above, but a little clearer yellow and the lines faintly reappear, that on the fore wings being a little curved.

This species belongs to the same section of the genus as *M. cervinaria* Pack., and is a little smaller, with the apex and angles of the wing more acute; behind the angles the wings are entire. There are no discal dots, and the moth is quite different from Guenée's *M. forficaria*, which does not yet seem to occur in American collections.

Length of body .60, of fore wing .77 inch. Nevada (Edwards).

Recognized by the acutely angled wings, the straight ferruginous line, and the deep orange ochre of the wings.

*Eurhinosea*¹ nov. gen.

Allied to *Caustoloma*. Head of medium size. Front very wide, much as in *Caustoloma*, the surface being convex, and the sides converging slightly in front. On anterior edge a pointed tuft of converging hairs extending between the palpi. ♂ antennæ subsimple, being ciliated, each joint widening anteriorly, the scales on the front edge being raised and spreading out; in ♀ much more filiform, slightly ciliated. Palpi remarkably long, second joint passing beyond the head by a distance about equal to the width of the front, third joint

¹ Εὐ, well, ῥις, ῥινός, nose.

unusually long and pointed, as long as second joint is wide. Tongue feebler than in *Caustoloma*, but of about the same size as in *Nematocampa*. Wings somewhat resembling those of *Caustoloma*, but not angulated; fore wings with costa more convex than in *Caustoloma*, but just as in *Nematocampa* and *Venilia*; apex obtusely pointed; outer edge full convex, but not angulated; inner edge two-thirds as long as costa. Hind wings much like those of *Caustoloma* in outline; but not hollowed out below the apex, neither are they convex, but the edge is straight between the apex and middle of the wing. The venation differs from that of *Caustoloma*, which it resembles most, in the costal area being wider, and consequently the costal vein and first three subcostal venules shorter and more oblique, and they are nearer together. On the secondaries the second subcostal venule arises much farther than usual from the discal spot, a third of the way from the dot to the end of the vein, while in *Caustoloma* it arises at the dot. The venation of the secondaries is more like *Nematocampa*.

Hind legs long and slender, tibiae with four stout spurs. Abdomen long and slender, just reaching the anal angle. In style of coloration the genus reminds us of *Caustoloma*, and more remotely of *Nematocampa*. The body and wings are yellow, with fawn colored costal spots, and the edges of the wings are stained with fawn. In size the only species yet known is intermediate between *Caustoloma* and *Nematocampa*. Its large, long, acute palpi, simple antennae with triangular joints, and its non-angulated wings, will distinguish the genus.

Eurhinosea flavaria. 4 ♂, 2 ♀.

Body and wings deep ochreous yellow. Palpi brown on sides of second joint. Fore wings clear yellow, costa fawn brown at base, two costal brown spots in the middle of the wing, the inner oblique, the outer nearly straight. No lines in the middle area of the wing; a small discal dot (sometimes wanting), a minute dot on the origin of the third or lower median venule; outer edge of the wing below the apex broadly margined with fawn brown to, and enclosing, the anal angle, the band being as broad as the thorax. Hind wings concolorous with the fore wings; a rather large dark dot close to the origin of the first subcostal venule, a triangular marginal patch just below the apex; otherwise no markings. Beneath, from a large basal costal spot, proceeds a fine curved line across the wing, and with a much curved one within, forms a ringlet. Beyond the conspicuous dark discal dot a broad diffuse pale brown shade crosses the

wing, slightly scalloped externally; the shade does not connect with the outer costal spot; the marginal shade is dark on the oblique upper edge, but is fainter towards the anal angle than on the upper side of the wing. A faint row of diffuse small spots between this shade and the middle shade. Hind wings with a very distinct discal dot. A narrow, fine, much curved line crosses the middle of the wing; another sinuate line midway between this and the margin; the part just below the apex is oblong rather than triangular, as above. Fringe brown on both wings, with darker spots on ends of venules beneath; towards anal angle of secondaries fringe becomes yellowish. The two ♀ and one ♂ are paler, without the marginal dark band, while the lines below are well marked, the ♂ median shade of primaries being represented by a very distinct sinuate line, with three rude ringlets on the inside of the line, and the fringe is yellowish; in another specimen the lines are much more distinct.

Length of body ♂, .45, ♀, .40 inch; fore wing ♂, .50, ♀, .50 inch. Sierra Nevada (Edwards).

This interesting species may be known by the non-angulated yellow wings, with the broad marginal shade, and the subtriangular spot on hind wing, and the large discal dots on hind wing on inner third of wing.

Sicya crocearia n. sp. 3 ♂, 4 ♀.

Sulphur yellow; palpi and orbits deep reddish orange; thorax sulphur yellow, concolorous with the primaries; hind wings pale yellow, a little deeper than the abdomen. Primaries crossed by two light brown lines, the inner (often obsolete) oblique, scarcely curved and bent at right angles on the costa; the outer runs straight from just beyond the middle of the inner edge of the wing to the costa, on which it forks, ending just before the apex; beyond this line the wing is pale fawn brown, the apical region clear yellow. Hind wings with a single sinuate reddish or brown line, beyond which the wing is tinged with reddish, while within the line it is inclined to be whitish. Beneath whitish yellow, primaries more yellow than secondaries; the outer line a broad reddish orange band, with the wing beyond tinged with the same color, the apical region yellowish; a brown or paler curved line on hind wings, with a few brown flecks beyond, though those are often wanting. Legs pale, a little darker at the ends of tibiae, or broadly ringed with dark brown.

Length of body ♂, .45, ♀, .35-.50; of fore wing ♂, .55, ♀, .47-.72 inch. California (Edwards and Behrens); Nevada (Edwards).

The inner line is often obsolete, or represented by a few spots; the outer varying in depth of color, usually but little darker than the brown portion beyond. Hind wings sometimes yellowish, with a brown line. A large ♀ from California, received from Mr. Behrens, differs from the others in having the outer line on fore wings obsolete between the median vein and the costa, and the lines brown, and hind wings more yellowish and speckled with brown scales.

In a single ♂ specimen from California, the costa of fore wings is arched, the wings being much broader and fuller; a distinct dark triangular costo-apical spot, while the base of costa is reddish, the secondaries much more rounded, and the line nearer the middle of the wing, and distinctly scalloped, but I judge the three forms to be simple local varieties, as the markings vary considerably in this genus. The five Nevada individuals are smaller than the others, and with narrower wings. This species differs from *Sicya truncataria* Gn., which it very closely resembles, in the more sinuate outer line on the fore wings, while the margin of the wing is deeper brown. Whether these differences are permanent cannot be determined unless we have more material.

Hesperumia n. gen.

Closely related to *Angerona*, agreeing with it in the strongly pectinated antennæ, the branches reaching to the tip, and in the large, well developed head, which is quite free from the thorax; the palpi much the same, but a little larger and blunter. Fore wings more pointed at the apex, and less angulated in the middle of the outer edge. The subcostal venules are shorter, sent more direct to the costa, and the costal interspace narrower than in *Angerona*. Hind wings full, not sinuate, the sinus being almost obsolete. Hind legs as in *Angerona*, the spurs of the same relative size. The female is much smaller than the male, while in *Angerona* the female is considerably larger than the male. In its mode of coloration this genus recalls *Rumia*, hence our generic name.

Hesperumia ochreata n. sp.

Deep ochreous, with brown flecks, and a large discal ring. Head ochreous, becoming reddish on the sides and anterior edge of the front; palpi dark brown, especially on the tips, with ochreous hairs at base on under side; antennæ brown, concolorous with the palpi. Front of the thorax deep ochreous, hinder portion, abdomen and legs much paler. Fore wings deep ochreous, more or less flecked with brown, sometimes the flecks are wanting; two lines, one crossing the

middle of the wing and forming a large discal ring larger than in the European *Rumia crategata*, and enclosing a pale dot; the line is a little sinuate, and is often obsolete, especially in rubbed specimens, leaving a distinct distal ring and costal spot just in front of it. An outer very sinuate row of spots, often obsolete, except on the costa. Wings brown.

Hind wings paler than fore wings, with no markings, but a little deeper ochreous towards the outer edge. Fringe concolorous with the rest of the wing.

Beneath on fore wings no lines or discal spot, but the outer costal brown spot is present, and there are brownish costal spots within. Hind wings same as above. Legs a little dusky at the femoro-tibial joints; tibiae a little dusky.

Length of body ♂, .55, ♀, .50 inch; of fore wing ♂, .72, ♀, .62 inch. 1 ♂, 2 ♀, Sierra Nevada, Cal.; and Nevada (Edwards).

***Metrocampa virido-perlata* n. sp.** 1 ♂, 1 ♀.

More nearly allied to our eastern species than to the European, but still it differs in the two bands on fore wing being nearer together, the inner band crossing the base of the origin of the third median venule. Antennæ the same.

Though the moths expand equally, yet in both sexes the head is much smaller than in *perlata*, an unusual distinction, while in *perlata* and *margaritacea* the head of the ♂ (no ♀ of *margaritacea* for comparison) are of the same size. The Nevada species is also a little greener than our species. Red band below antennæ, as in *perlata*.

Until a large number of specimens are compared I shall consider the species distinct, though they would be easily confounded at first.

Length of body ♂, .50, ♀, .60 inch; fore wing ♂, .77, ♀, 1 inch.

Sierra Nevada, Cal., (Edwards).

***Selidosema juturnaria* Guen.**

Alaska (J. Behrens); Colorado Terr., (Ridings, Coll. Amer. Ent. Soc.).

***Tetracis parallelia* n. sp.**

Allied in general form to *T. truxaliata*. The two outer subcostal venules much shorter than in that species. A fresh specimen, though smaller (length of fore wing .42), from Mr. Behrens, is ochreous, though paler than in *T. truxaliata*, with deep reddish ochreous lines on fore wings. Angle of hind wings well marked, though much less distinct than in *T. truxaliata*.

California (Behrens).

Eutrapela falcata n. sp. 1 ♀.

A slighter, though not smaller, moth than *E. agrotata*,¹ and with the wings much more angulated, and the apex of the fore wings much more falcate than in *E. transversata*, or any other species known to me. Antennæ slightly slenderer than in *E. transversata*. Pale ochreous. Head, body and wings, of the same hue. Fore wings with no lines, and with only a few scattered blackish speckles, a conspicuous black discal dot, and three subapical black spots, one just behind the costal edge. Hind wings with a few scattered specks and a distinct black discal dot. Beneath marked, just as above, the three subapical and discal spots being reproduced. Wings a little more densely speckled with black, and the fore wings a little deeper ochreous.

Length of body .65, fore wing .82 inch. California (Edwards).

This fine species may be at once known by the very acute falcate apex, the want of lines on the wings, and the three subapical large black spots. The front of the head is ochreous, like the rest of the body.

An egg retained on the end of the abdomen is apparently spherical, with numerous high, and very distinct longitudinal ridges.

Drepanodes Panamaria n. sp. 2 ♂.

This species differs structurally in some important characters from the more northern species known to me. The wings are a little shorter, and the apex much less falcate than usual; the first subcostal interspace is much shorter and smaller than in *D. varus* and *sesquilinea*, and all the venules sent off towards the outer edge of the wing are shorter than usual. The hind tibiæ are greatly swollen, nearly twice as much so as in *D. sesquilinea*, and the spurs are much shorter. Antennæ broadly pectinated, fully as much as usual. Body and wings pale yellow ochreous, and of the same shade as above and beneath, including the legs. Fore wings with traces of a narrow basal curved ferruginous line. An outer oblique pale ferruginous line straight in its course (not curved as usual), just below the apex. On the costa, just in front of the angle, is a geminate black spot, and another spot on the apex. Another larger spot between the first and second median venules, and a large round black patch on

¹I regard *Cherodes* as congeneric with *Eutrapela clemataria* Hübner, and *nubilata* Pack.; *C. agrotata* (Guen.) should therefore fall into Hübner's genus *Eutrapela*.

the inner angle. Beyond the outer line the wing is fawn brown, and also the hind wings; the latter are crossed by a single faint narrow ferruginous straight line. Both wings have scattered black speckles. Beneath as above, except that there are no lines, but the brownish margins of both wings are as well marked as above. Minute discal dots above and below, on both pairs of wings. Fore tibiae a little dusky.

Length of body .45, of fore wings .50 inch. Panama (Edwards).

Recognized, besides its singular structural features, by the edge of both wings being broadly shaded with pale fawn brown.

This description of a Panama species of *Drepanodes* is appended, as the genus may yet occur in southern California.

EXPLANATION OF PLATE 1.

- Fig. 1, bis. *Larentia 12-lineata* Pack.
" 2. *Eupithecia Nevadata* Pack.
" 3. *Larentia cretaceata* Pack.
" 4. *Hyria occidentaria* Pack.
" 5. *Hypsipetes albifasciata* Pack.
" 6. *Cidaria glaucata* Pack.
" 7. *Melanippe Kodiakata* Pack.
" 8. *Larentia cumatilis* (Grote).
" 9. *Phibalapteryx carnata* Pack.
" 10. *Melanthia brunneiciliata* Pack.
" 11. *Coremia lignicolorata* Pack.
" 12. *Scotosia Californiata* Pack.
" 13. *Cidaria leoninata* Pack.
" 14. *Acidalia rubrolinearia* Pack.
" 15. *Acidalia subalbaria* Pack.
" 16. *Acidalia Californiaria* Pack.
" 17. *Acidalia 5-linearia* Pack.
" 18. *Acidalia rubromarginaria* Pack.
" 19. *Selidosema juturnaria* Guen.
" 20. *Tephrosia falcataria* Pack.
" 21. *Tephrosia ferruginosaria* Pack.
" 22. *Eutrapela falcata* Pack.
" 23. *Gorytodes trilinearia* Pack.
" 24. *Gorytodes uncanaria* Guen.



PACKARD, PHALÆNIDÆ.

